

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2048-11-02T07:40:28.600
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 3424538645290549760
 2Mass ID (if available) : 05595396+2256382

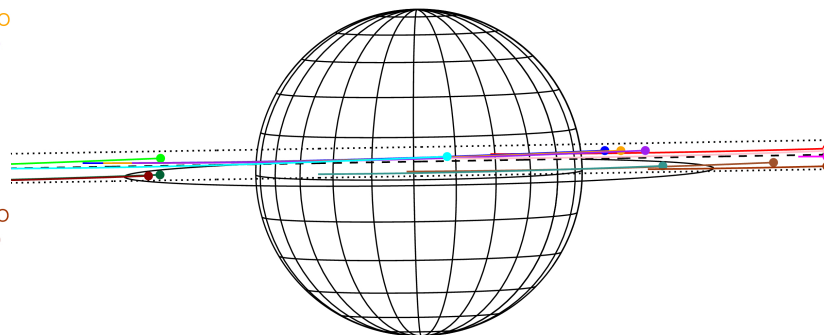
Jupiter 2048-11-02T07:40:28 K9.75 G13.65 Pgt

ICRS Star Coord at Epoch: 05h 59m 53.95834s +22:56:38.31094s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 9.750
 G magnitude : 13.647
 RP magnitude : 12.566
 BP magnitude : 14.864
 DUPflag : 0
 Distance (au) : 4.397
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -6.49
 Sun-Target sep (deg) : 129.90
 Sun-Moon sep (deg) : 79.32
 B (ring opening deg) : 2.55
 PA of pole (deg) : 0.83
 Pole direction: RA (deg): 268.05735
 Dec (deg): 64.49721
 C/A sky separation (") : 1.504
 C/A sky separation (km) : 4796.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp



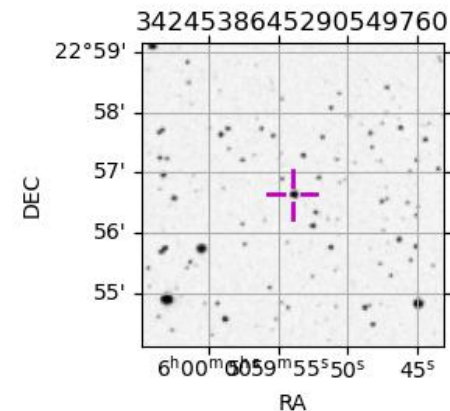
2048-11-02T07:40:28.6000 α: 05 59 53.9583 s: +22 56 38.311 C/A 1.515" PA 180.96 deg v_sky - 6.49 km/s D 04.40 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 PMO
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



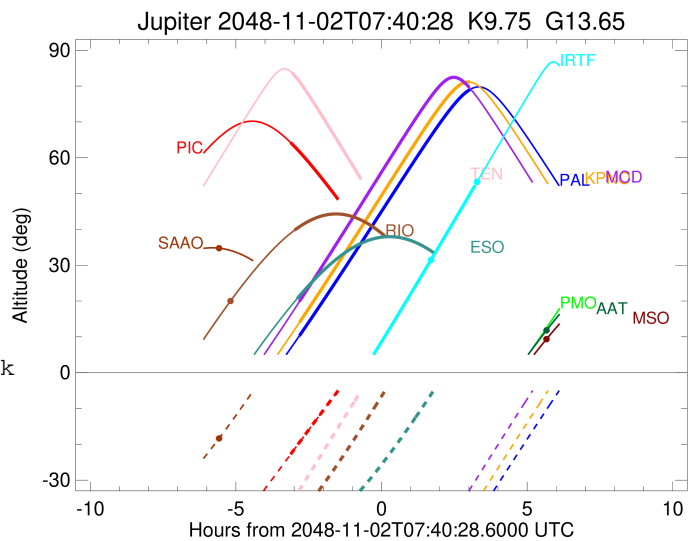
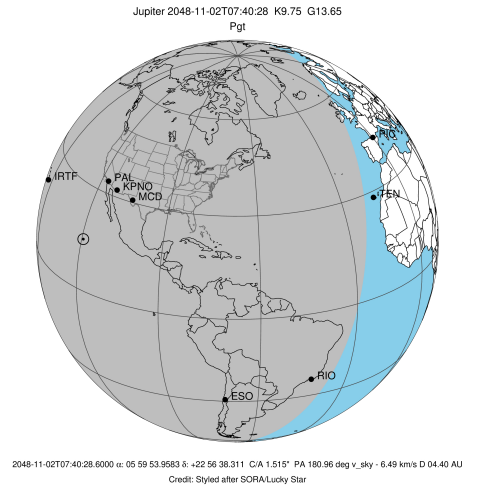
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	NOV 02 04:33 - NOV 02 04:33	Pin
PAL	Palomar Mt (200")	33.4	243.1	+ +	NOV 02 04:51 - NOV 02 10:43	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	NOV 02 04:51 - NOV 02 10:42	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	NOV 02 04:51 - NOV 02 10:40	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	NOV 02 04:35 - NOV 02 04:35	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5			Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	NOV 02 04:41 - NOV 02 04:41	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	NOV 02 04:46 - NOV 02 04:46	Pin
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-02T07:29:28.320
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : PIC
Location            : Pic du Midi
Latitude (deg)      : 42.93656
E. Longitude (deg)  : 0.14231
Altitude (km)       : 2.890
Gaia source ID      : 3424538645290549760
2Mass ID (if available) : 05595396+2256382
ICRS Star Coord at Epoch: 05h 59m 53.95834s +22:56:38.31094s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 9.750
G magnitude          : 13.647
RP magnitude         : 12.566
BP magnitude         : 14.864
DUPflag             : 0
Distance (au)       : 4.397
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -6.49
Sun-Target sep (deg) : 129.90
Sun-Moon sep (deg)  : 79.71
B (ring opening deg) : 2.55
PA of pole (deg)    : 0.83
Pole direction: RA (deg): 268.05735
Dec (deg): 64.49721
C/A sky separation ("): 2.532
C/A sky separation (km): 8074.6
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

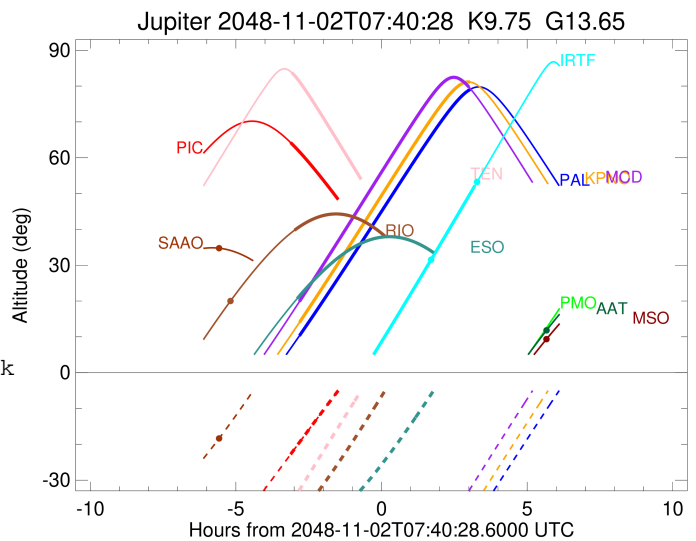
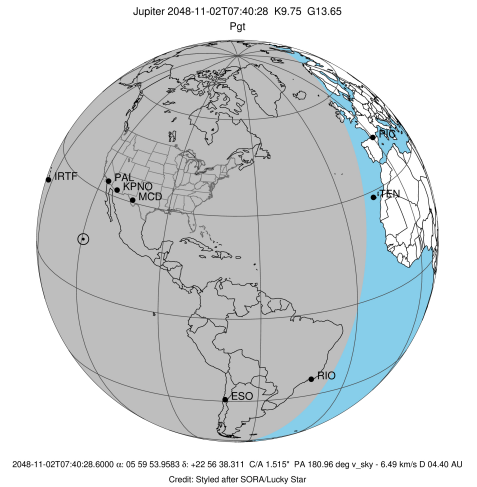


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-02T04:33:11.001	64.23	-22.80	71491.9	5.83	6.66
Jupiter	E	2048-11-02T10:30:40.177	2.22x	29.90x	71491.8	7.48	8.54

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-02T07:50:56.290
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : PAL
Location            : Palomar Mt (200")
Latitude (deg)      : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)       : 1.706
Gaia source ID      : 3424538645290549760
2Mass ID (if available) : 05595396+2256382
ICRS Star Coord at Epoch: 05h 59m 53.95834s +22:56:38.31094s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 9.750
G magnitude          : 13.647
RP magnitude         : 12.566
BP magnitude         : 14.864
DUPflag             : 0
Distance (au)       : 4.397
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.49
Sun-Target sep (deg) : 129.90
Sun-Moon sep (deg)  : 80.09
B (ring opening deg) : 2.55
PA of pole (deg)    : 0.83
Pole direction: RA (deg): 268.05735
Dec (deg): 64.49721
C/A sky separation ("): 2.044
C/A sky separation (km): 6519.1
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

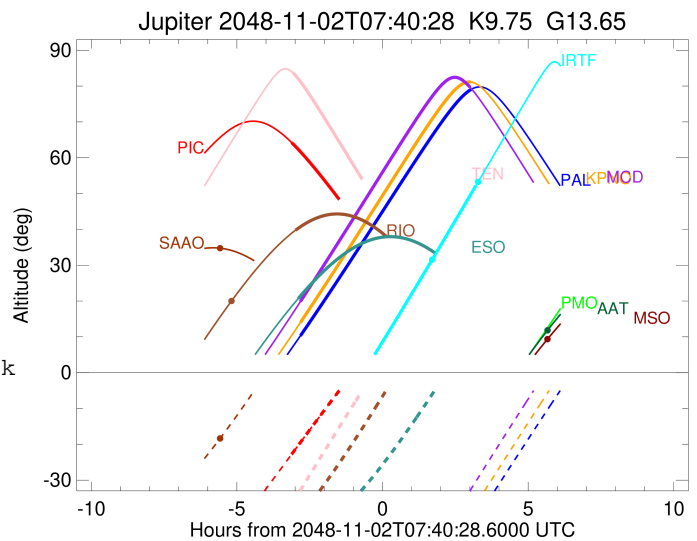
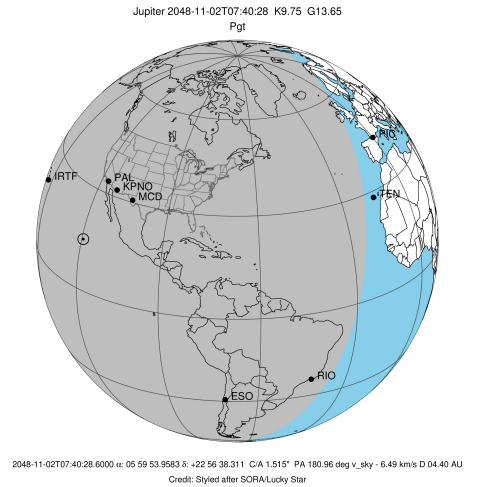


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-02T04:51:22.775	10.30	-49.63	71491.9	6.54	7.47
Jupiter	E	2048-11-02T10:43:41.789	79.11	-42.89	71491.9	4.62	5.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-02T07:50:10.770
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : KPNO
Location            : Kitt Peak Natl Obs
Latitude (deg)      : 31.96333
E. Longitude (deg) : 248.40000
Altitude (km)      : 2.120
Gaia source ID     : 3424538645290549760
2Mass ID (if available) : 05595396+2256382
ICRS Star Coord at Epoch: 05h 59m 53.95834s +22:56:38.31094s
RUWE (>1.4 is poor) : 1.06
K magnitude         : 9.750
G magnitude         : 13.647
RP magnitude        : 12.566
BP magnitude        : 14.864
DUPflag            : 0
Distance (au)      : 4.397
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -6.49
Sun-Target sep (deg) : 129.90
Sun-Moon sep (deg)  : 80.14
B (ring opening deg) : 2.55
PA of pole (deg)    : 0.83
Pole direction: RA (deg): 268.05735
Dec (deg): 64.49721
C/A sky separation (") : 1.960
C/A sky separation (km) : 6251.2
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

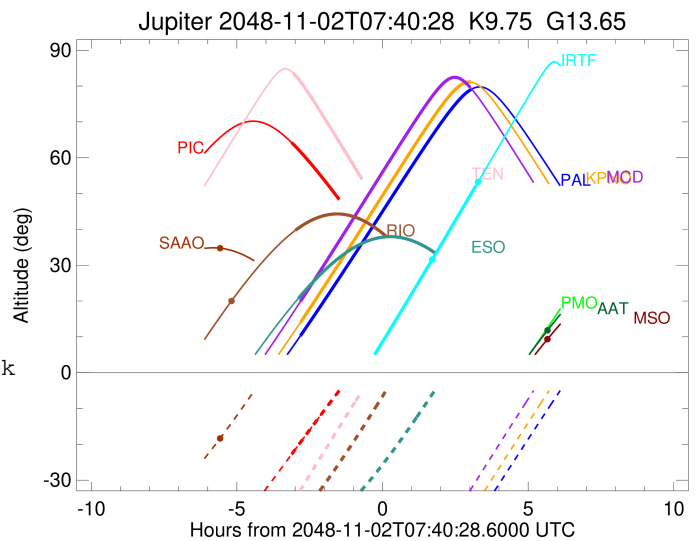
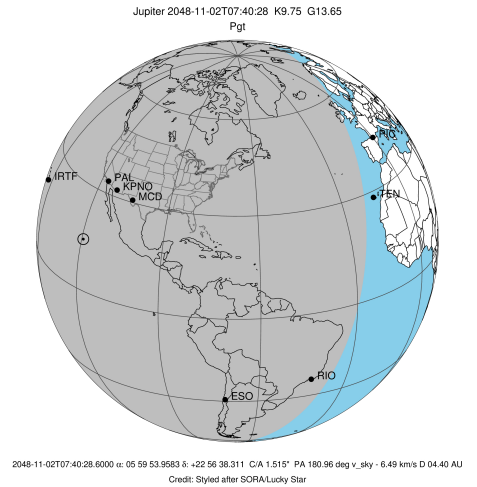


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-02T04:51:29.183	14.04	-54.30	71491.9	6.29	7.18
Jupiter	E	2048-11-02T10:42:32.268	81.13	-38.94	71491.9	4.50	5.14

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-02T07:48:51.570
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : MCD
Location            : McDonald Obs. 2.7m
Latitude (deg)      : 30.67158
E. Longitude (deg)  : 255.97844
Altitude (km)       : 2.075
Gaia source ID      : 3424538645290549760
2Mass ID (if available) : 05595396+2256382
ICRS Star Coord at Epoch: 05h 59m 53.95834s +22:56:38.31094s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 9.750
G magnitude          : 13.647
RP magnitude         : 12.566
BP magnitude         : 14.864
DUPflag             : 0
Distance (au)       : 4.397
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.49
Sun-Target sep (deg) : 129.90
Sun-Moon sep (deg)  : 80.19
B (ring opening deg) : 2.55
PA of pole (deg)    : 0.83
Pole direction: RA (deg): 268.05735
Dec (deg): 64.49721
C/A sky separation ("): 1.868
C/A sky separation (km): 5958.0
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

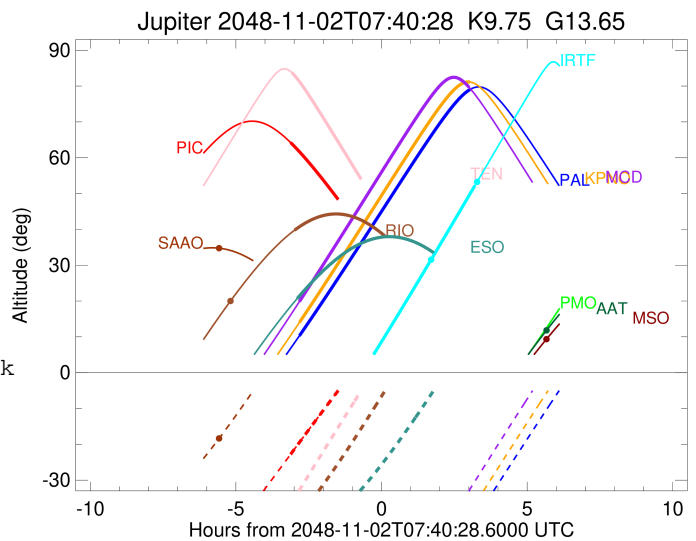
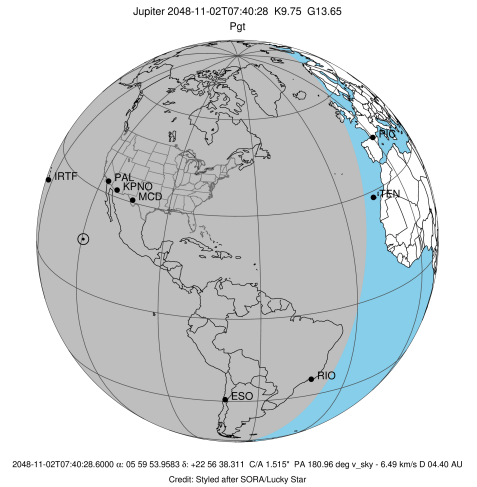


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-02T04:51:20.265	19.83	-60.74	71491.9	5.97	6.82
Jupiter	E	2048-11-02T10:40:48.734	79.67	-32.93	71491.9	4.42	5.05

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-02T07:29:37.400
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : TEN
Location             : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 3424538645290549760
2Mass ID (if available) : 05595396+2256382
ICRS Star Coord at Epoch: 05h 59m 53.95834s +22:56:38.31094s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 9.750
G magnitude           : 13.647
RP magnitude         : 12.566
BP magnitude         : 14.864
DUPflag              : 0
Distance (au)        : 4.397
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.49
Sun-Target sep (deg) : 129.90
Sun-Moon sep (deg)   : 79.87
B (ring opening deg) : 2.55
PA of pole (deg)     : 0.83
Pole direction: RA (deg): 268.05735
Dec (deg): 64.49721
C/A sky separation ("): 1.936
C/A sky separation (km): 6175.3
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

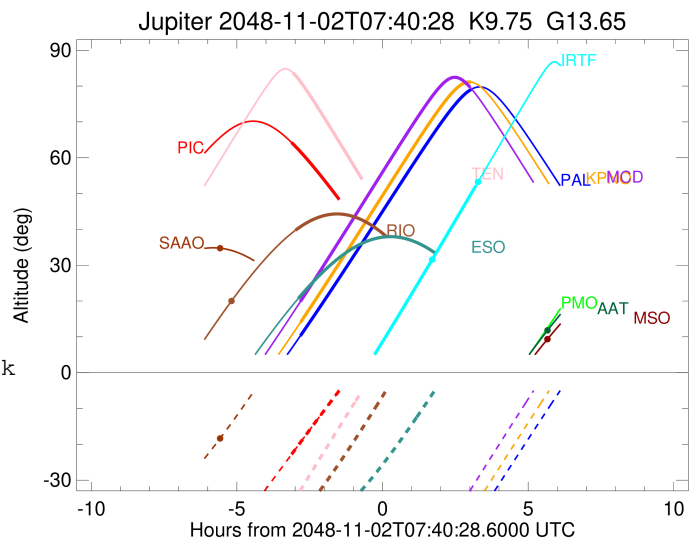
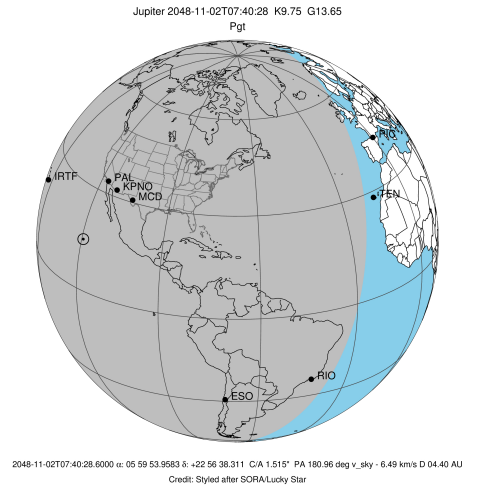


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-02T04:35:49.456	83.73	-36.20	71491.9	4.45	5.09
Jupiter	E	2048-11-02T10:28:01.534	8.77	34.93x	71491.9	6.10	6.97


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-02T07:56:20.800
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : IRTF
Location             : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 3424538645290549760
2Mass ID (if available) : 05595396+2256382
ICRS Star Coord at Epoch: 05h 59m 53.95834s +22:56:38.31094s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 9.750
G magnitude          : 13.647
RP magnitude         : 12.566
BP magnitude         : 14.864
DUPflag             : 0
Distance (au)        : 4.397
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.49
Sun-Target sep (deg) : 129.90
Sun-Moon sep (deg)   : 79.63
B (ring opening deg) : 2.55
PA of pole (deg)     : 0.83
Pole direction: RA (deg): 268.05735
Dec (deg): 64.49721
C/A sky separation ("): 2.018
C/A sky separation (km): 6435.6
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

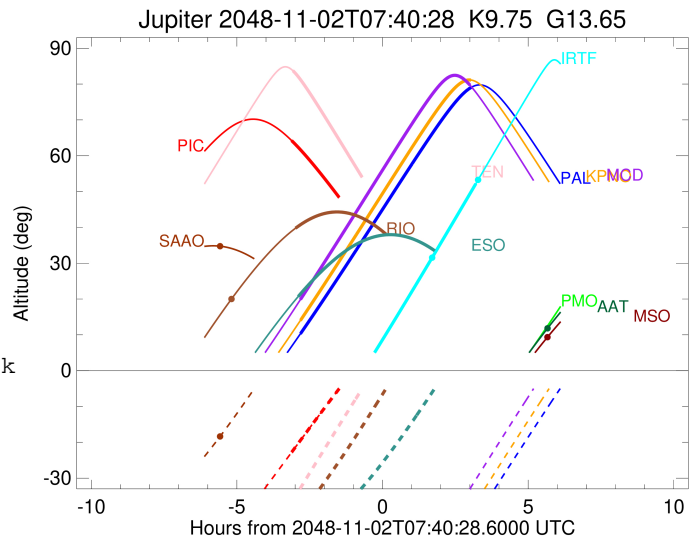
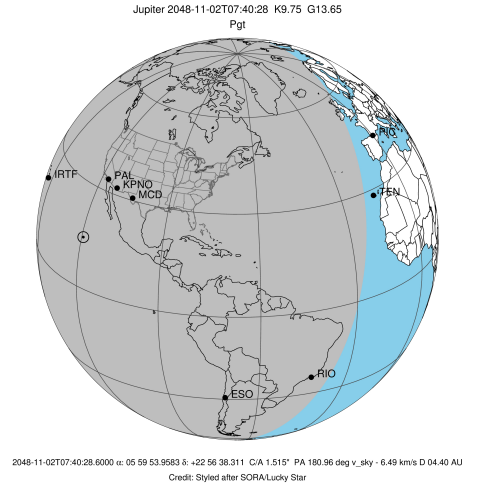


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-02T04:49:17.147	-26.44x	-15.10	71491.9	6.75	7.70
Jupiter	E	2048-11-02T10:52:46.829	52.19	-77.75	71492.0	3.81	4.35

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-02T07:34:34.060
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : RIO
Location            : Rio de Janeiro
Latitude (deg)      : -22.89506
E. Longitude (deg)  : 316.77708
Altitude (km)       : 0.033
Gaia source ID      : 3424538645290549760
2Mass ID (if available) : 05595396+2256382
ICRS Star Coord at Epoch: 05h 59m 53.95834s +22:56:38.31094s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 9.750
G magnitude          : 13.647
RP magnitude         : 12.566
BP magnitude         : 14.864
DUPflag             : 0
Distance (au)       : 4.397
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.49
Sun-Target sep (deg) : 129.90
Sun-Moon sep (deg)  : 79.84
B (ring opening deg) : 2.55
PA of pole (deg)    : 0.83
Pole direction: RA (deg): 268.05735
Dec (deg): 64.49721
C/A sky separation ("): 0.141
C/A sky separation (km): 451.2
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

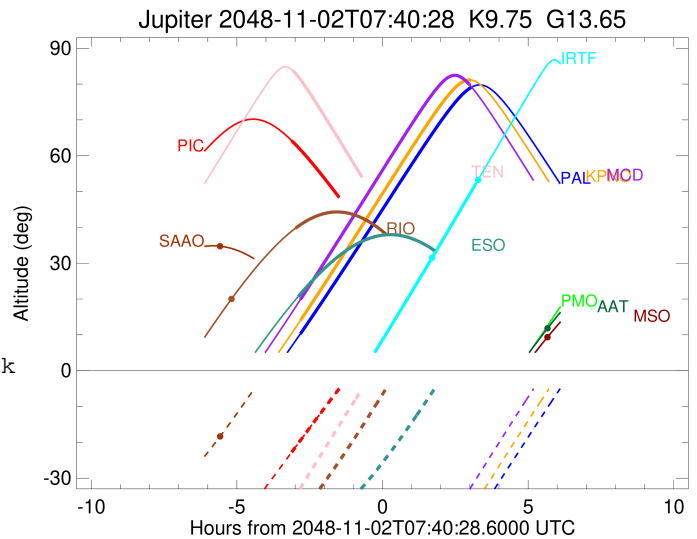
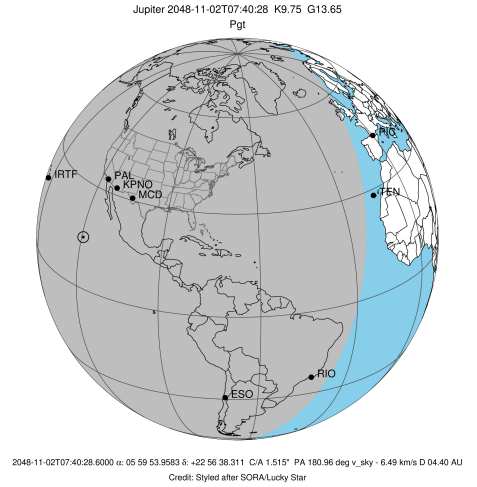


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-02T04:41:33.033	39.79	-41.41	71492.0	0.41	0.47
Jupiter	E	2048-11-02T10:29:22.041	11.37	31.47x	71492.0	1.23	1.41


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-02T07:41:09.450
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : ESO
Location              : European Southern Obs. (3.6m)
Latitude (deg)        : -29.26097
E. Longitude (deg)    : 289.26831
Altitude (km)         : 2.400
Gaia source ID        : 3424538645290549760
2Mass ID (if available) : 05595396+2256382
ICRS Star Coord at Epoch: 05h 59m 53.95834s +22:56:38.31094s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 9.750
G magnitude           : 13.647
RP magnitude          : 12.566
BP magnitude          : 14.864
DUPflag              : 0
Distance (au)         : 4.397
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -6.49
Sun-Target sep (deg)  : 129.90
Sun-Moon sep (deg)    : 79.90
B (ring opening deg) : 2.55
PA of pole (deg)      : 0.83
Pole direction: RA (deg): 268.05735
Dec (deg): 64.49721
C/A sky separation (") : 0.073
C/A sky separation (km) : 233.8
NAIF SPICE kernels    : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```



x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-02T04:46:39.171	20.66	-45.68	71492.0	0.45	0.51
Jupiter	E	2048-11-02T10:33:59.089	25.57	8.87x	71492.0	0.14	0.17